

K4LED

Georgia Amateur Radio Astronomy Observatory

Observation Date: 08-13-2018, 0:14:44 to 00:20:44 UTC

Location: Lat. 34.42322 N, Lon. -84.49413 W (Jasper, GA 30143)

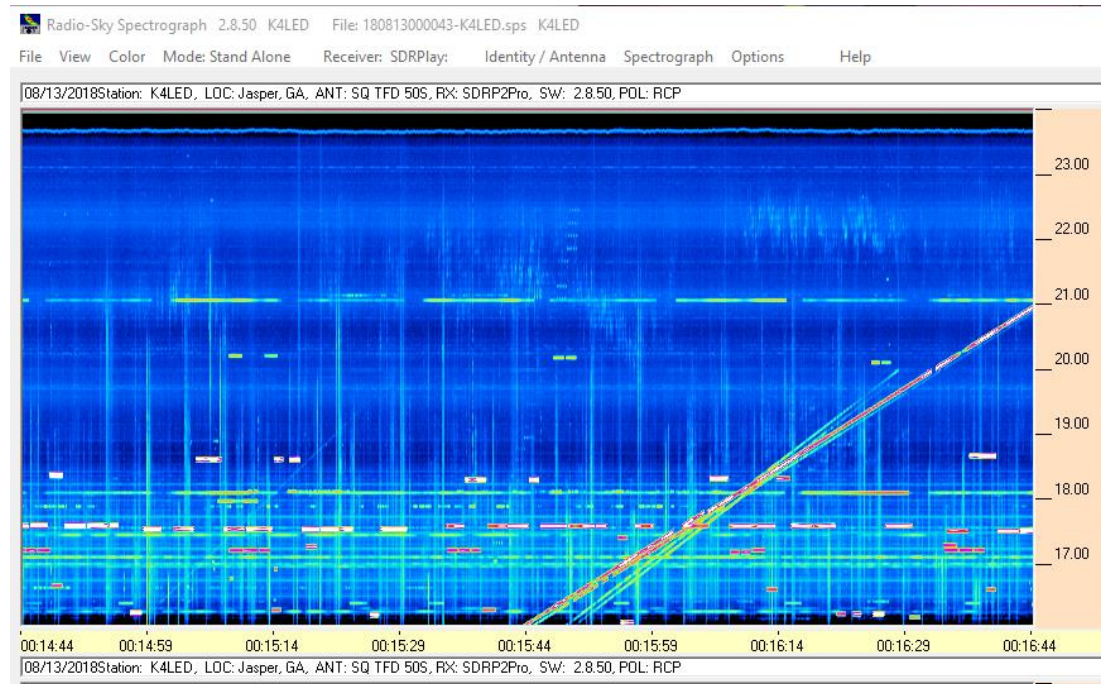
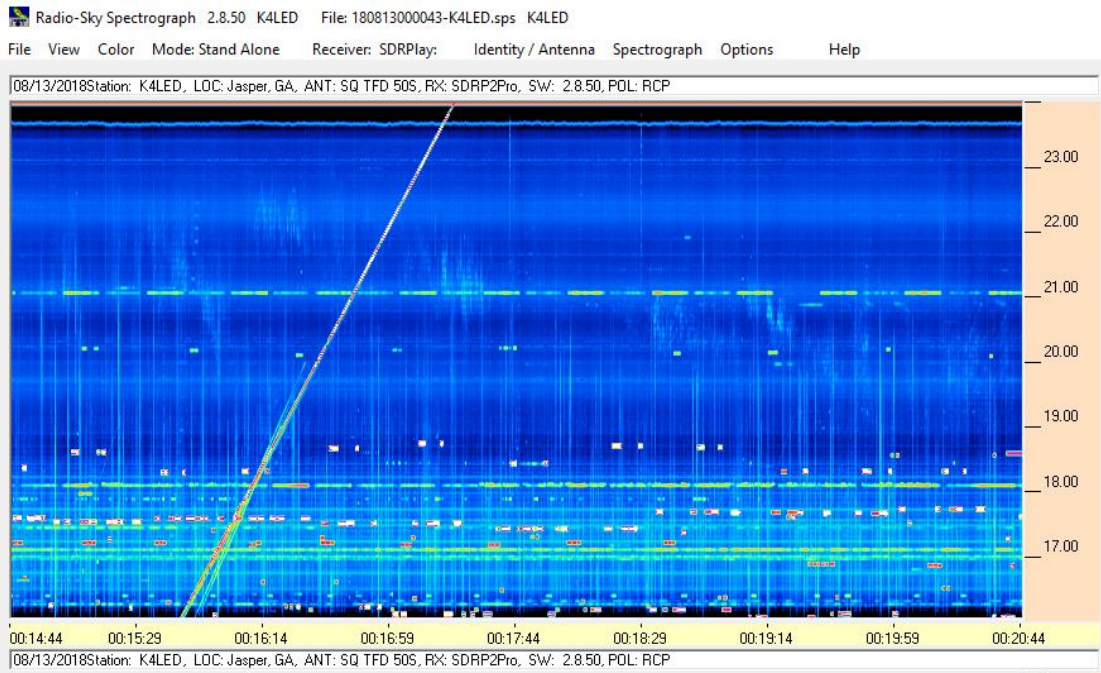
Object: Io-B

Observer: Larry E. Dodd

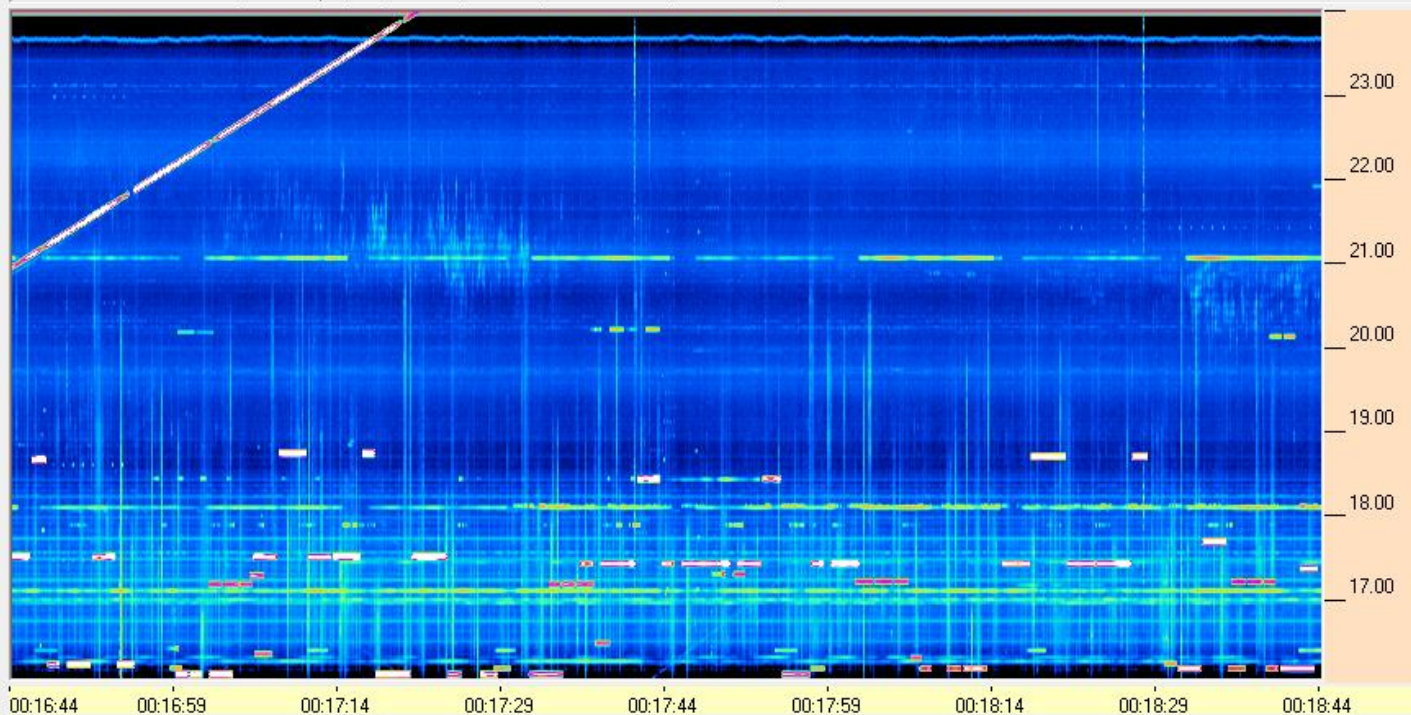
Receivers: Flagg FSX11, SDRPlay2PRO, Flagg RJ1.1

Software: SkypipeII 2.7.34, Spectrograph 2.8.50

Antennas: Radio Jove Dual Dipole Kit, Typinski Square TFD

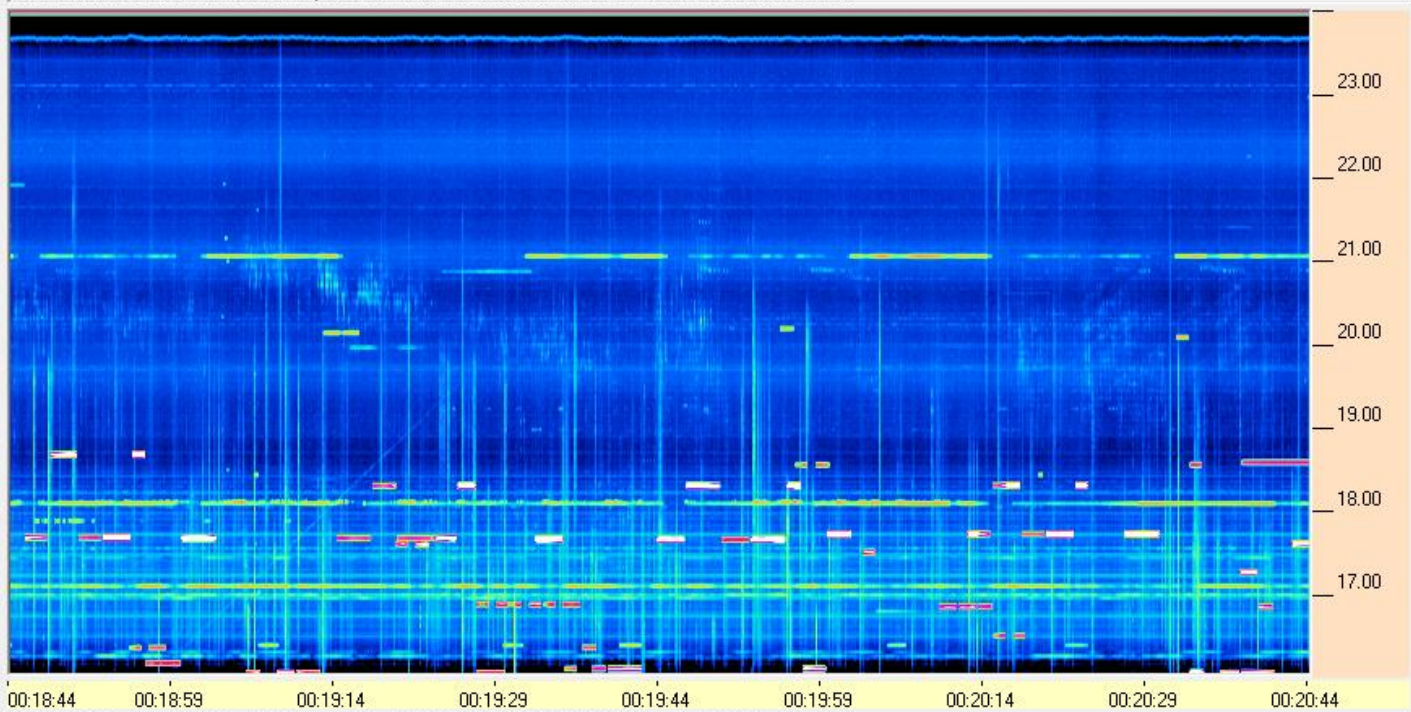


08/13/2018 Station: K4LED, LOC: Jasper, GA, ANT: SQ TFD 50S, RX: SDRP2Pro, SW: 2.8.50, POL: RCP



08/13/2018 Station: K4LED, LOC: Jasper, GA, ANT: SQ TFD 50S, RX: SDRP2Pro, SW: 2.8.50, POL: RCP

08/13/2018 Station: K4LED, LOC: Jasper, GA, ANT: SQ TFD 50S, RX: SDRP2Pro, SW: 2.8.50, POL: RCP



08/13/2018 Station: K4LED, LOC: Jasper, GA, ANT: SQ TFD 50S, RX: SDRP2Pro, SW: 2.8.50, POL: RCP



Station YYYY DAY DDD HHMMSS P1 FFS S AXN PPS IGA PS
Eglin AFB 2018 Aug13 225 001500 RSF 1 713 100 03+ 79

foF2 5.600
foF1 N/A
foF1p N/A
foE N/A
foEp 1.46
fxI 6.33
foEs N/A
fmin 2.23

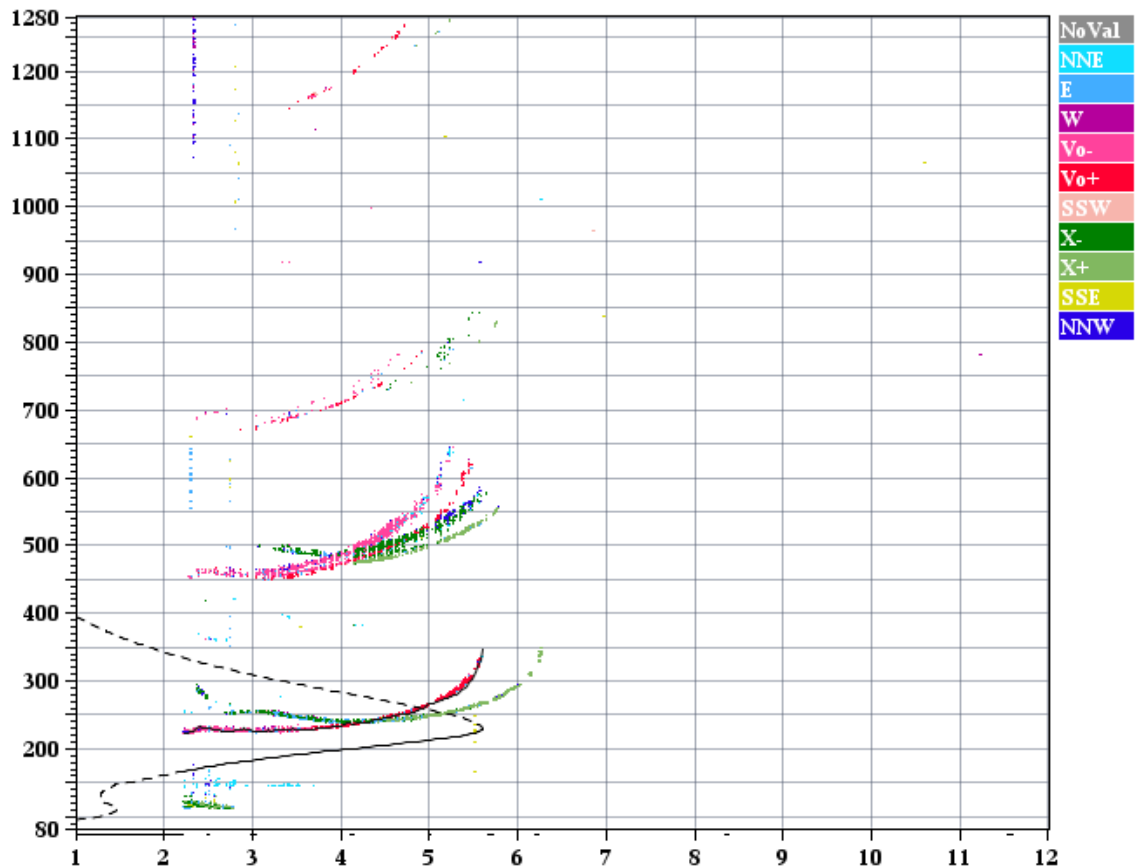
MUF(D) 20.11
M(D) 3.59
D N/A

h⁺F 222.5
h⁺F2 222.5
h⁺E N/A
h⁺Es N/A

hmF2 229.1
hmF1 N/A
hmE 110.0
yF2 42.3
yF1 N/A
yE 20.0
B0 50.7
B1 1.48

C-level 11

Auto:
Artist5
500200



D 100 200 400 600 800 1000 1500 3000 [km]
MUF 6.2 6.3 6.6 7.1 7.8 8.9 12.0 20.1 [MHz]

87184797.tmp / 440fx512h 25 kHz 2.5 km / DPS-4D EG931 084 / 30.5 N 273.5 E

ShowIonogram v 1.0

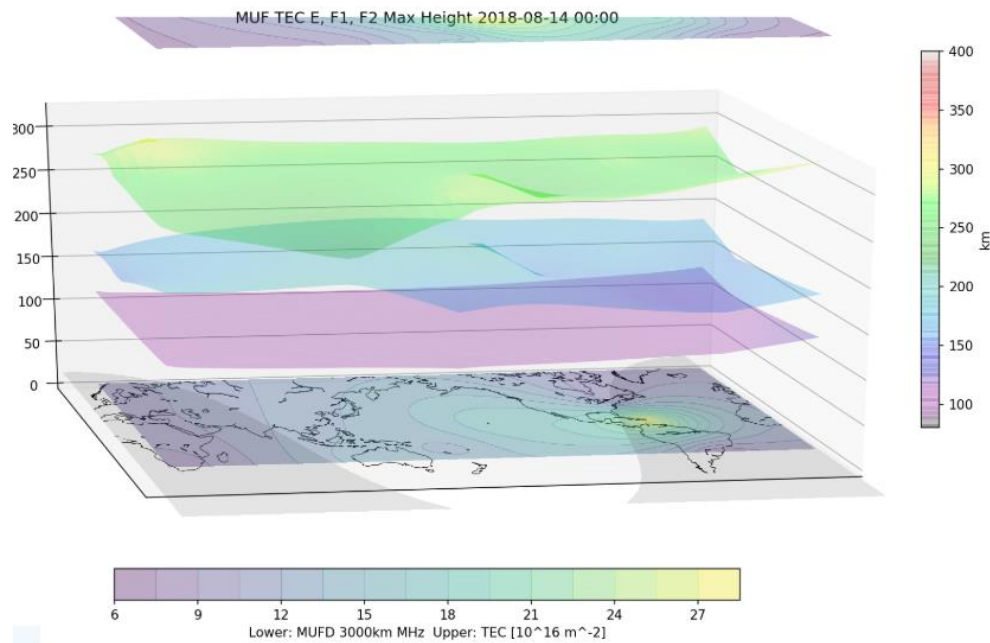
References for Interpreting the Ionogram:

http://www.sws.bom.gov.au/IPSHosted/INAG/uag_23a/UAG_23A_indexed.pdf

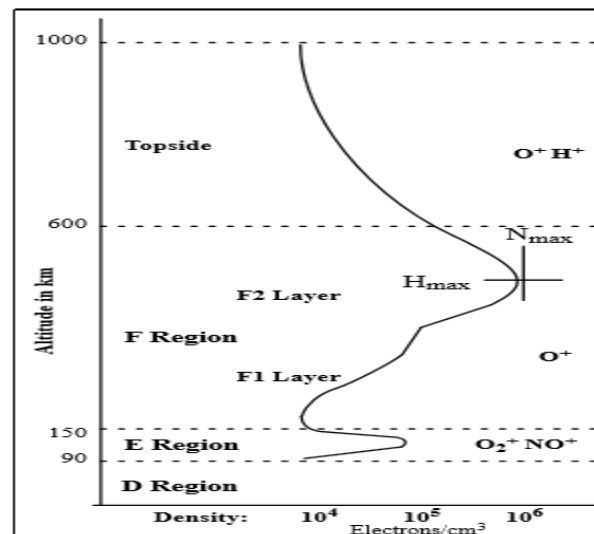
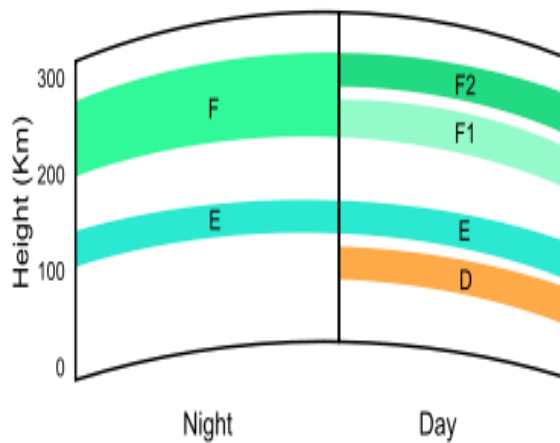
<http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.404.5517&rep=rep1&type=pdf>

<https://www.hfunderground.com/wiki/index.php/Ionosonde>

Ionosphere Layers, MUF, Total Electron Content



Data Global Ionospheric Radio Observatory (GIRO) Principal Investigator Prof. R. W. Reinisch UMass Lowell



The **critical frequency** is the limiting frequency at or below which a radio wave is reflected by an ionospheric layer at vertical **incidence**. If the transmitted frequency is higher than the **plasma frequency** of the ionosphere, then the electrons cannot respond fast enough, and they are not able to re-radiate the signal. It is calculated as shown below:

$$f_{\text{critical}} = 9 \times \sqrt{N}$$

where N = electron density per m^3 and f_{critical} is in Hz.

The Maximum Usable Frequency (MUF) is defined as the upper frequency limit that can be used for transmission between two points at a specified time.

$$f_{\text{muf}} = \frac{f_{\text{critical}}}{\sin \alpha}$$

where α = **angle of attack**, the angle of the wave relative to the **horizon**, and $\sin$ is the **sine** function.

Reference: <https://en.wikipedia.org/wiki/Ionosphere>

